

IN THE CLAIMS

Please renumber the claims as requested by the Examiner as indicated below.

Please amend claims 31-34 and 36-39 as indicated below.

This listing of claims will replace all prior versions, and listings, of the claims in the Application.

Listing of Claims:

Claim 1 (original) A method for identifying a data structure associated with a packet of data comprising the steps of:

receiving a packet of data;

extracting one or more fields from a packet header of said packet of data to generate a search key;

selecting a table to be accessed using said search key;

determining whether to identify said data structure associated with said packet of data using a content addressable memory or a tree based on a table definition of said selected table; and

identifying said data structure associated with said packet of data in response to said determination step.

Claim 2 (original) The method as recited in claim 1, wherein if said table definition of said selected table determined to use said content addressable memory to identify said data structure then the method further comprises the steps of:

transferring said search key to a tree search engine; and

associating said search key with a particular thread number/table number pair.

Claim 3 (original) The method as recited in claim 2, wherein said search key is transferred to a particular address in a first register in said tree search engine, wherein said particular address in said first register is used to decode said particular thread number/table number pair associated with said search key.

Claim 4 (original) The method as recited in claim 3 further comprising the steps of:

transferring said search key from said tree search engine to one or more search key registers in an interface unit, wherein said interface unit interfaces said tree search engine and said content addressable memory.

Claim 5 (original) The method as recited in claim 4 further comprising the step of:

transferring said particular address used to decode said particular thread number/table number pair associated with said search key to a second register in said interface unit.

Claim 6 (original) The method as recited in claim 4 further comprising the step of:

transferring said search key from one of said one or more search key registers to said content addressable memory.

Claim 7 (original) The method as recited in claim 6 further comprising the steps of:

identifying a particular entry number in said content addressable memory based on said search key; and

identifying said data structure associated with said packet of data in a data structure memory based on said particular entry number in said content addressable memory.

Claim 8 (original) The method as recited in claim 6 further comprising the step of:

determining whether said search key matches a particular entry in said content addressable memory.

Claim 9 (original) The method as recited in claim 8, wherein if said search key matches said particular entry in said content addressable memory then said content addressable memory returns a particular entry number.

Claim 10 (original) The method as recited in claim 9 further comprising the steps of:

shifting said particular entry number;

adding said particular entry number to a base address, wherein said base address comprises a starting address of said data structure memory;

storing a result of said particular entry number added to said base address in a result register; and

reading said result in said result register, wherein said result is indexed in said result register based on said particular thread number/table number pair associated with said search key.

Claim 11 (original) The method as recited in claim 10, wherein said result is a pointer used to index into an appropriate entry in said data structure memory to identify said data structure associated with said packet of data.

Claim 12 (original) The method as recited in claim 1 further comprising the step of:
performing a particular action on said packet of data based on said data structure identified in said data structure memory.

Claim 13 (original) The method as recited in claim 10, wherein said result in said result register is a pointer in a same format when said tree is used to identify said data structure associated with said packet of data.

Claim 14 (original) The method as recited in claim 5, wherein said one or more search key registers and said second register in said interface unit are organized in a pipeline manner, wherein said search key is associated with one or more thread number/table number pairs.

Claim 15 (original) A packet processor comprising:
an internal processor, wherein said internal processor comprises circuitry for:
receiving a packet of data;
extracting one or more fields from a packet header of said packet of data to generate a search key;
selecting a table to be accessed using said search key; and
determining whether to identify a data structure associated with said packet of data using a content addressable memory or a tree based on a table definition of said selected table;

a tree search engine coupled to said internal processor;

a data structure memory coupled to said tree search engine, wherein said data structure memory comprises a plurality of data structures, wherein said data structure of said plurality of data structures comprises data relating to specific actions said internal processor is to perform on said packet of data; and

said content addressable memory coupled to said tree search engine via an interface unit, wherein said content addressable memory stores a plurality of entries, wherein each of said plurality of entries has an entry number associated with it; and wherein said tree search engine comprises circuitry for:

identifying said data structure associated with said packet of data in response to said internal processor determining whether to identify said data structure associated with said packet of data using said content addressable memory or said tree based on said table definition of said selected table.

Claim 16 (original) The system as recited in claim 15, wherein said internal processor further comprises circuitry for:

transferring said search key to a tree search engine; and

associating said search key with a particular thread number/table number pair.

Claim 17 (original) The system as recited in claim 16, wherein said search key is transferred to a particular address in a first register in said tree search engine, wherein said particular address in said first register is used to decode said particular thread number/table number pair associated with said search key.

Claim 18 (original) The system as recited in claim 17, wherein said tree search engine further comprises circuitry for:

transferring said search key from said tree search engine to one or more search key registers in said interface unit, wherein said interface unit interfaces said tree search engine and said content addressable memory.

Claim 19 (original) The system as recited in claim 18, wherein said tree search engine further comprises circuitry for:

transferring said particular address used to decode said particular thread number/table number pair associated with said search key to a second register in said interface unit.

Claim 20 (original) The system as recited in claim 18, wherein said interface unit comprises circuitry for:

transferring said search key from one of said one or more search key registers to said content addressable memory.

Claim 21 (original) The system as recited in claim 20, wherein said content addressable memory comprises circuitry for:

identifying a particular entry number in said content addressable memory based on said search key.

Claim 22 (original) The system as recited in claim 21, wherein said tree search engine further comprises circuitry for:

identifying said data structure associated with said packet of data in said data structure memory based on said particular entry number in said content addressable memory.

Claim 23 (original) The system as recited in claim 20, wherein said interface unit further comprises circuitry for:

determining whether said search key matches a particular entry in said content addressable memory.

Claim 24 (original) The system as recited in claim 23, wherein if said search key matches said particular entry in said content addressable memory then said content addressable memory returns a particular entry number.

Claim 25 (original) The system as recited in claim 24, wherein said interface unit further comprises circuitry for:

shifting said particular entry number;

adding said particular entry number to a base address, wherein said base address comprises a starting address of said data structure memory;

storing a result of said particular entry number added to said base address in a result register; and

reading said result in said result register, wherein said result is indexed in said result register based on said particular thread number/table number pair associated with said search key.

Claim 26 (original) The system as recited in claim 25, wherein said result is a pointer used to index into an appropriate entry in said data structure memory to identify said data structure associated with said packet of data.

Claim 27 (original) The system as recited in claim 15, wherein said internal processor further comprises circuitry for:

performing a particular action on said packet of data based on said data structure identified in said data structure memory.

Claim 28 (original) The system as recited in claim 25, wherein said result in said result register is a pointer in a same format when said tree is used to identify said data structure associated with said packet of data.

Claim 29 (original) The system as recited in claim 19, wherein said one or more search key registers and said second register in said interface unit are organized in a pipeline manner, wherein said search key is associated with one or more thread number/table number pairs.

Claim 30 (original) A method for identifying a data structure associated with a packet of data comprising the steps of:

receiving a packet of data;

extracting one or more fields from a packet header of said packet of data to generate a search key;

transferring said search key to a content addressable memory by a tree search engine configured to identify said data structure associated with said packet of data;

identifying a particular entry number in said content addressable memory based on said search key; and

identifying said data structure associated with said packet of data based on said particular entry number in said content addressable memory.

Claim 31 (currently amended) The method as recited in claim ~~[[29]]~~ 30, wherein if said search key matches a particular entry in said content addressable memory then said content addressable memory returns said particular entry number.

Claim 32 (currently amended) The method as recited in claim ~~[[29]]~~ 30, wherein if said search key does not matches a particular entry in said content addressable memory then said content addressable memory returns a null pointer.

Claim 33 (currently amended) The method as recited in claim ~~[[29]]~~ 30 further comprising the step of:

performing a search in said content addressable memory using said search key; and

determining whether said search in said content addressable memory is complete.

Claim 34 (currently amended) The method as recited in claim ~~[[32]]~~ 33, wherein if said search in said content addressable memory is not complete then the method further comprises the step of:

loading a register with a pointer, wherein said pointer points to said register.

Claim 35 (original) A packet processor comprising:

an internal processor, wherein said internal processor comprises circuitry for:

receiving a packet of data; and

extracting one or more fields from a packet header of said packet of data to generate a search key;

a tree search engine coupled to said internal processor, wherein said tree search engine comprises circuitry for:

transferring said search key to a content addressable memory;

a data structure memory coupled to said tree search engine, wherein said data structure memory comprises a plurality of data structures, wherein a data structure of said plurality of data structures is associated with said packet of data, wherein said data structure comprises data relating to specific actions said internal processor is to perform on said packet of data; and

said content addressable memory coupled to said tree search engine via an interface unit, wherein said content addressable memory stores a plurality of entries, wherein each of said plurality of entries has an entry number associated with it, wherein said content addressable memory comprises circuitry for:

identifying a particular entry number in said content addressable memory based on said search key; and

wherein said tree search engine further comprises circuitry for:

identifying said data structure associated with said packet of data based on said particular entry number in said content addressable memory.

Claim 36 (currently amended) The system as recited in claim ~~[[34]]~~ 35, wherein if said search key matches a particular entry in said content addressable memory then said content addressable memory returns said particular entry number.

Claim 37 (currently amended) The system as recited in claim ~~[[34]]~~ 35, wherein if said search key does not matches a particular entry in said content addressable memory then said content addressable memory returns a null pointer.

Claim 38 (currently amended) The system as recited in claim ~~[[36]]~~ 37, wherein said content addressable memory further comprises circuitry for:

performing a search in said content addressable memory using said search key; and

determining whether said search in said content addressable memory is complete.

Claim 39 (currently amended) The system as recited in claim ~~[[34]]~~ 35, wherein if said search in said content addressable memory is not complete then the said interface unit comprises circuitry for:

loading a register with a pointer, wherein said pointer points to said register.